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RE: Beal-Hermosa Creek Flood Study

Rick,

The following is my report on the Beal-Hermosa flood study. The attached map has my delineation shown in red. Could you please mail this back to me once you are through with it. I need it for documentation and future reference. If you have any questions or need further information please contact me.

Sincerely,

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Summary

In general the results of this floodplain study on Hermosa Creek, adjacent to the Beal property, show that the 100-yr flood is contained within the banks of the channel as defined in the model. Because the channel is very steep and the flow area is relatively large it has the capacity to carry the design flow of 4400 cfs. However, during large flow events in mountainous area debris and erosion can result in increased depths and shifting flowlines. Because of this I would recommend that some minimum setback from the top of the channel bank be established. I would recommend a horizontal setback that provides a minimum of three vertical feet between the computed 100-year flood elevation and any proposed construction. Justification is discussed below.

Study Details

This report presents the results of the 100-yr flood study completed on Hermosa Creek adjacent to the Kelly and Spencer Beal property. The study is based on the cross-sectional survey data provided by RLS Surveying and hydrologic and hydraulic data from the FEMA flood study for the area just downstream.

This river reach is very steep with an average slope of over 2% (0.0226) and consequently falls within the supercritical flow regime common to mountain streams. The table summarizes the result of the HEC-RAS computer simulation of the floodplain. For reference, surveyed XS-1 is about 20 feet upstream of the bridge and interpolated section XS-1.8 runs through the existing house.

Summary of Model Results.

River Sta	River Dist	Min Ch El	W.S. Elev	Crit W.S.	Vel Chnl	Top Width	Flow Depth
	(ft)	(ft)	(ft)	(ft)	(ft/s)	(ft)	(ft)
Upstream 4	696	6786.8	6793.5	6793.5	12.4	78.9	6.7
Surveyed XS-3	496	6782.7	6788.9	6789.4	13.8	72.9	6.2
Surveyed XS-2	366	6779.9	6786.9	6787.2	13.7	64.6	7.0
House XS 1.8	322	6778.9	6785.5	6786.2	15.2	62.3	6.6
Surveyed XS-1	200	6776.0	6783.8	6784.3	14.7	57.9	7.8
Downstream 0	0	6771.3	6778.7	6779.6	15.9	56.1	7.4

The elevation of the channel invert is shown in the column labeled Min Ch El. There is a datum difference between the field survey and the FEMA study of about 26.5 feet. This has no impact on the accuracy of the results but adjustments would be necessary if any elevation comparisons are made between the two studies.

For your use, the most important columns in this table will be top width and water surface elevation (W.S. Elev). Using this information I have delineated the floodplain on the map you provided. Since the contours do not extend down towards the channel far enough to cover the edge of the floodplain I interpolated using your plotted cross-sections as a guide. You may have other data (spot elevations) that might give a more detailed delineation in this area. Since the boundary is within the banks I don't think that this is of much concern.

During my site visit I measured the height of the bridge. The approximate distance to the low chord is 9 feet from the channel invert. The modeled depth at XS-1 is 7.8 feet leaving just over 1 ft of clearance. It appears that the 100-yr event will barely pass under the bridge. Again, during a storm debris could easily accumulate at the bridge causing a blockage. This could result in increased depths upstream and out flanking or overtopping of the bridge. This is a good reason to provide a suggested setback .